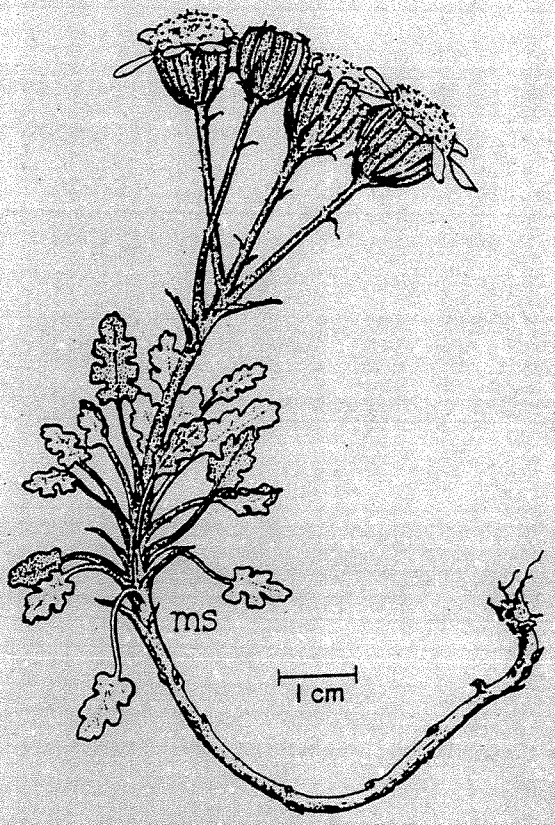
SAN FRANCISCO GROUNDSEL

(Senecio franciscanus)

RECOVERY PLAN



U.S. Fish and Wildlife Service

Albuquerque, New Mexico

1987

RECOVERY PLAN FOR

SAN FRANCISCO PEAKS GROUNDSEL

Senecio franciscanus Greene

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for

Region 2
U.S. Fish and Wildlife Service
Albuquerque, New Mexico

Approved: _____
Regional Director, Region 2

Date: 10/5/87

DISCLAIMER

This completed San Francisco Peaks Groundsel Recovery Plan has been approved by the U.S. Fish and Wildlife Service. The Plan does not necessarily represent official positions, approvals of cooperating agencies, or the views of all individuals who played a role in its preparation. This plan is subject to modification as dictated by new findings, changes in the species' status, and completion of tasks described in the plan. Goals and objectives will be attained and funds expended contingent upon appropriations, priorities, and other constraints.

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SUMMARY

Goal:	To remove the endangered San Francisco Peaks groundsel from the Federal list of threatened and endangered species by managing its essential habitat to sustain natural populations in the wild.
Recovery Criteria:	The criteria for delisting San Francisco Peaks groundsel will be to demonstrate long-term stability in population levels and habitat through continued monitoring, ensure that actions identified in Habitat Management Plan are implemented, and ensure suitability of delisting actions.
Actions Needed:	Major steps to meet the recovery criteria include: the enforcement of existing regulations; extension of an improved trail system to the top of Humprey's Peak to provide an exit from the alpine zone; development of a conservation agreement between Forest Service and Fish and Wildlife Service on monitoring and enforcement of closure; and the development of public awareness, appreciation and support for preservation of the San Francisco Peaks groundsel.

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1980). Without the adverse impacts caused by man, Senecio franciscanus appears to have stable, viable populations and therefore favorable recovery potential (Holden et al. 1984).

This plan outlines the steps necessary to achieve and document long-term stability of San Francisco Peaks groundsel populations in the wild by removing and preventing threats to the plant and its habitat. Attainment of these goals will lead to the ultimate objective of removal of the San Francisco Peaks groundsel from the Federal list of endangered and threatened species.

Taxonomy and Morphology

Edward L. Greene first discovered this species on July 10, 1884. He noted that it was "plentiful, but scarcely yet in flower at the date of its discovery" (Greene 1889). The type specimen was collected by Greene in 1889 (Kearney and Peebles 1964) and there are no synonyms of the scientific name recognized (Phillips and Peterson 1980). Elbert L. Little (1941) collected the plant in 1938 and included it in his collection of the alpine flora and in the first description of vegetation above the timberline on the San Francisco Peaks. Since then several botanists have studied the alpine flora (Moore 1965, Paulik 1979, Rominger and Paulik 1983, Schaack 1970) but the San Francisco Peaks groundsel remains unknown outside of the alpine zone of the San Francisco Peaks.

Senecio franciscanus is a dwarf perennial alpine plant, 3-10 cm (1.25-4 inches) tall. Stems arise singly from the upturned ends of creeping rhizomes, or are sometimes loosely clustered, giving the plant a subcaespitose aspect. The lower parts and often the involucral bracts are purplish. The basal leaves are petiolate, the leaf blades are deeply lobed with the terminal lobes 3-19 mm (0.12 to 0.75 inch) wide and about as long, and the upper leaves are much reduced. One to six flower heads occur on peduncles 19 mm (0.75 inch) long. The involucre is 6-9.5 mm (0.25-0.38 inch) high and about 9.5-12 mm (0.38-0.5 inch) wide when the flowers are blooming. The flower heads have 8-13 yellow ray flowers and the seeds are glabrous (Barkley 1968, McDougall 1973).

The San Francisco Peaks groundsel develops as small clones propagated vegetatively from the intricately branched rhizomes. Frost action and gravitational movement break up the clones, which in turn further spread, develop, and break up. It reproduces sexually from mature achenes (Holden et al. 1984, Phillips Phillips and Peterson 1980, Rominger 1976).

Current Status

Past and Present Distribution and Abundance

Presently Senecio franciscanus occurs on the San Francisco Peaks, Coconino County, Arizona (Figure 1). It occurs in the Kachina Peaks Wilderness Area, Coconino National Forest, approximately 16 km (10 miles) north of Flagstaff. Thriving populations occur on Humphreys, Agassiz, Fremont, and Doyle peaks above 3,440 m (11,300 feet), and along the north rim that extends northeast from Humphreys Peak (Boucher and Goodwin 1984, Holden et al. 1984).

This species appears to be reproductively healthy. (Boucher and Goodwin 1984, Holden et. al. 1984, Phillips and Peterson 1980). Fletcher (Boucher and Goodwin 1984, Holden et al. 1984) estimates that there are probably greater than 100,000 clones of San Francisco Peaks groundsel on the Peaks, and even this estimate may be lower. The San Francisco Peaks groundsel occupies a minimum of 131 hectares (325 acres) within the approximately 486 hectares (1,200 acres) of total alpine habitat on the San Francisco Peaks (Boucher and Goodwin 1984, Holden et al. 1984).

Habitat

The San Francisco Peaks groundsel grows as a primary succession species on talus in the alpine fellfield on the San

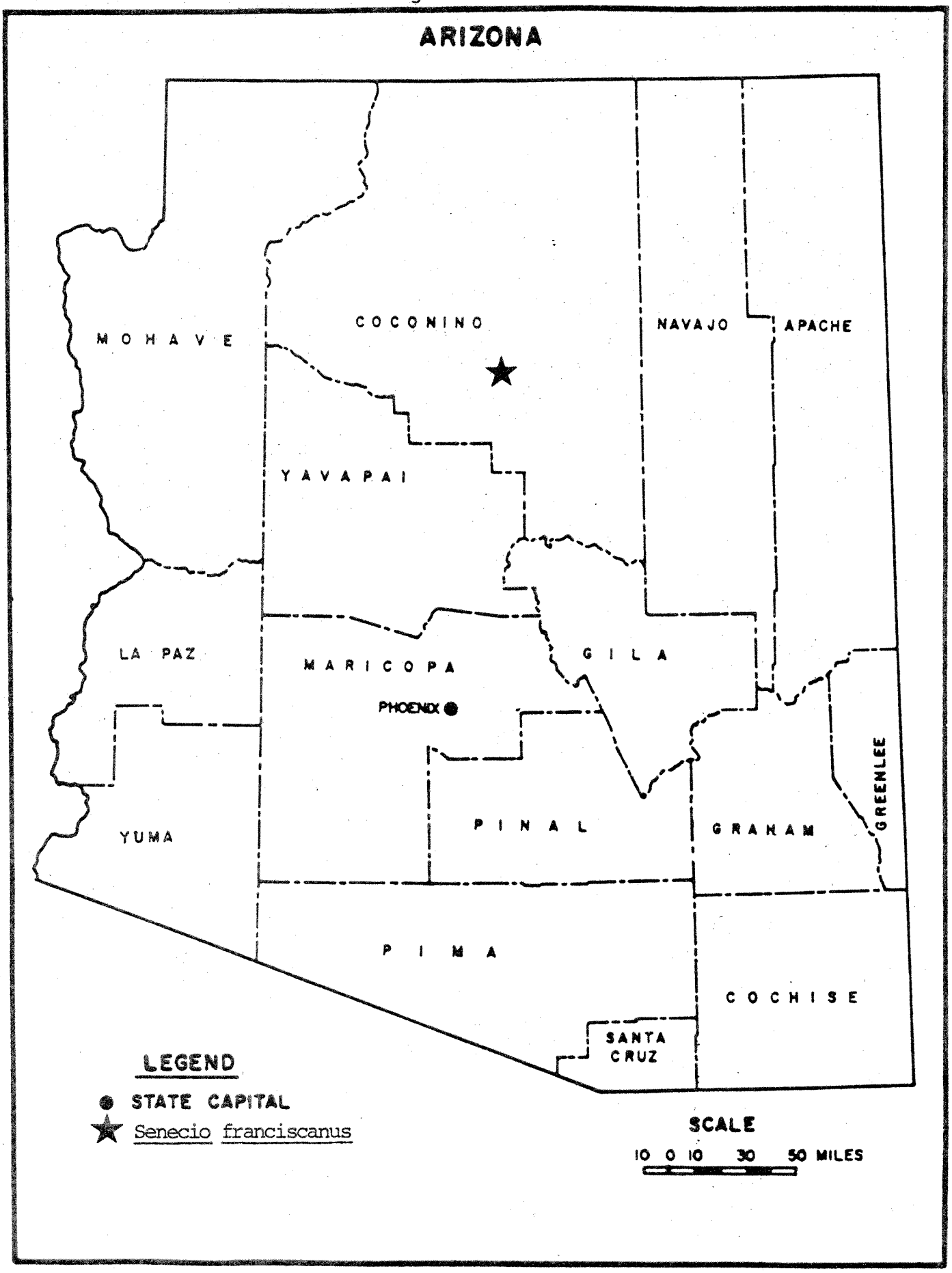

Figure 1. Distribution of Senecio franciscanus in Arizona.

Francisco Peaks. The San Francisco Peaks, a Pleistocene-age strato-volcano, rise abruptly from a basal elevation of approximately 2,130 m (7,000 feet) on the Colorado Plateau to an elevation of 3,852 m (12,633 feet). This is the most southwesterly located alpine tundra in the United States, and the only true alpine tundra in Arizona (Goodwin 1978).

The crest line of the mountain is divided into three principle peaks that project above timberline -- Humphreys Peak, Agassiz Peak, and Fremont Peak -- and several minor peaks (Goodwin 1978). The parent rock on the San Francisco Peaks consists of basalt, rhyolite, and andesite (Boucher and Goodwin 1984). The soils fall under the rock outcrop and barren talus slopes of the Sponseller-Baldy-Sizler Association (U.S. Department of Agriculture, Soil Conservation Service 1972). A complete description of a soil pit is on file at the Forest Supervisor's Office, Coconino National Forest (Goodwin, pers. comm. 1985).

Soils on the alpine fellfield consist of cinders on loose substrate, and thus are very gravelly, sandy loams; the pH is 6.6 (Rominger 1976). The ground surface is gravelly and the existing boulders are more rounded with better lichen development than in the boulder field (Goodwin 1978). The plant was found to be common in areas of fine to medium grain soils on inclines ranging from moderate to 60 percent (Boucher and Goodwin 1984). With the exception of one small population, aspect ranged from 45-315 degrees (northeast to northwest). The largest populations and

greatest densities occur on slopes with aspects ranging from 180-270 degrees (south to west) (Boucher and Goodwin 1984). Plants occur from 3,445-3,780 m (11,300-12,400 feet), and are common on every major peak in the San Francisco Mountains above 3,476 m (11,400 feet) (Boucher and Goodwin 1984).

The average annual precipitation range is 84-102 cm (33-40 inches) (Little 1941). Precipitation during summer thunderstorms occurs when moist air from the Gulf of Mexico moves northwestward over the state. Arizona winter storms develop in the Pacific northwest from frontal advances that move southward from the Gulf of Alaska. These storms lose much of their moisture as snow over the high mountainous terrain before reaching Arizona (Sellers and Hill 1974).

The growing season occurs from June to September; mean air temperature over this period is 9°C (48°F). The average frost-free season is 102 days (Little 1941). The mean air temperature during the growing season is often close to freezing, but the ground level microenvironment may be much warmer, 32-38°C (90-100°F), on warm sunny days (Goodwin 1978). Average wind speeds of 32-48 kmph (20-30 mph) are common during the winter and spring, and speeds exceeding 96 kmph (60 mph) are not uncommon. Summer winds are not as strong but are constant (Goodwin 1978).

The vegetation is of low stature (less than 30 cm [12 inches] tall) very sparse, and characterized by herbs, grasses,

occasional shrubs, and, at timberline, dwarf trees (Krummholz) (Goodwin 1978, Schaack 1970). The alpine fellfield is dominated by San Francisco Peaks groundsel, which does not occur in the other two alpine habitats of alpine boulder field and alpine meadow, except in instances where soil conditions are similar to the fellfield. Frequently the species is the only flowering plant present for dozens of meters and is remarkably constant in dispersion within its suitable habitat. Plant cover over large areas is generally between a trace and 2 percent. In localized, relatively stable areas with well developed colonies, plant cover can reach 10 percent or higher.

The plants grow in exposed, sunny situations. Owing to exposure to high winds, snow accumulation is generally light, and the microclimate is typical fellfield. Severe frost action is a limiting factor for most plant species. Senecio franciscanus is adapted to natural soil movement owing to frost action and gravity on the steep slopes of the Peaks. Mature plant colonies are found near rocks where they are better sheltered from harsh elements (Boucher and Goodwin 1984). Soil moisture is the most important factor controlling distribution and growth of alpine plants (Goodwin 1978). Wind also plays a significant role by influencing moisture patterns, producing mechanical abrasion of plants, reducing air and leaf temperatures, and influencing pollination. Along ridges and high exposed areas, fine soil particles are removed, leaving only coarse material and allowing

desiccation of the exposed root zone after plants are trampled (Goodwin 1978).

Associated Species

Associated plants are: Whipple's beardtongue (Penstemon whippleanus), gooseberry currant (Ribes montigenum), spreading wheatgrass (Agropyron scribneri), alum root (Heuchera versicolor), mouse-ear chickweed (Cerastium beeringianum), sandwort (Arenaria lanuginosa), dandelion (Taraxacum sp.), fescue (Festuca ovina var. brachyphylla), wild candytuft (Thlaspi montanum var. fendleri), bristlecone pine (Pinus aristata), engelmann spruce (Picea engelmannii), corkbark fir (Abies lasiocarpa var. arizonica), sneezeweed (Helenium hoopesii), sedges (Carex spp.), blue grass (Poa spp.), bromegrass (Bromus ciliatus), and fragile bladder fern (Cystopteris fragilis) (Rominger 1976). The flora of the alpine tundra consists of 82 species (Little 1941, Schaack 1970).

Impacts and Threats

At the time of listing, threats to Senecio franciscanus were trampling and habitat destruction by hikers (which were expected to intensify as visitor use increased owing to the proposed Snow Bowl Ski Area expansion), and inadequate regulation of off-trail hiking (Fletcher et al. 1984, Phillips and Peterson 1980, USFWS 1983).

Throughout the tundra, a multiple system of trails has been caused by hikers (Goodwin 1978). Hikers traversing the steep slopes of suitable groundsel habitat cause excessive soil movement, ranging from displacement of footprint-size areas to rockslides several meters wide and 30 meters long. With this type of traffic, soil movement becomes excessive and the rhizome system of the San Francisco Peaks groundsel may be broken into fragments that are too small to sustain the plant. Habitat has been destroyed by intensive recreational use between the ski terminal on Agassiz Peak and the false summit, construction of the lift landing, and recreation in the immediate vicinity of the landing (Holden et al. 1984).

The alpine area was closed to off-trail use in 1984. A hiking trail was constructed in 1984 from the upper Snow Bowl Lodge at 2,900 m (9,500 feet) to the saddle north of Agassiz Peak. At the saddle, the new trail joined the existing ridge trail that leads north to Humphreys Peak and the Weatherford trail down the east side of Agassiz Peak. Trail routes were carefully selected from aerial photographs to follow already impacted trails and bypass San Francisco Peak's groundsels as much as possible. Any plants in the path of the trail were transplanted. In mid-July 1985 the alpine on Agassiz Peak was closed to hiking and protected by a split-rail fence (Goodwin, pers. comm. 1985, Holden et al. 1984, Reid, pers. comm. 1985). Appropriate signs inform hikers to stay on trails to protect the alpine habitat and the San Francisco Peaks groundsel. Public announcements have been made

and monitoring for closure compliance has begun (Goodwin, pers. comm. 1985, Holden et al. 1984, Reid 1984, Reid, pers. comm. 1985). It is estimated that 95 percent of the visitors will obey travel restrictions (M. Reid, Coconino National Forest, Flagstaff Ranger District, pers. comm. 1985).

The existing Snow Bowl road will be widened and paved in the future, a project that will result in an increase in summer use of the alpine area (Fletcher et al. 1984, Holden et al. 1984). However, the actions described above and completed by the U.S. Forest Service for protection of the fragile tundra environment and the San Francisco Peaks groundsel habitat should prevent future impacts on this species (Goodwin, pers. comm. 1985, Reid, pers. comm. 1985).

Management Efforts

Following the listing of Senecio franciscanus in 1983, Forest Service personnel conducted searches and established monitoring plots. Senecio franciscanus has been addressed in the following planning documents: Alpine Tundra Management Plan (Holden et al. 1984), Monitoring Plan for Senecio franciscanus (Boucher 1984), and the Proposed Coconino National Forest Plan (U.S.D.A. Forest Service 1985).

Legal Protection

Senecio franciscanus is on the Arizona State Protected list, Arizona Native Plant law, Arizona Revised Statute, Regulation No. R3-1-144. It is not to be collected except by permit for scientific or educational purposes. This species is also on the U.S. Forest Service Sensitive Plant List which prohibits taking of Senecio franciscanus in the Coconino National Forest.

The Endangered Species Act of 1973, as amended in 1982, prohibits the removal from Federal lands and reduction to possession of plants listed under the provisions of the Act. It is also prohibited for any person subject to the jurisdiction of the United States to sell, offer for sale, import, export, or transport in interstate or foreign commerce in the course of a commercial activity, any listed plant species. Under certain circumstances, the Act also provides for the issuance of permits to carry out otherwise prohibited activities involving listed species. The Endangered Species Act provides additional protection for this species through Section 7 (interagency cooperation) requirements.

The Lacey Act, as amended in 1981, also provides some protection for San Francisco Peaks groundsel. Under this Act it is prohibited to import, export, sell, receive, acquire, purchase, or engage in the interstate or foreign commerce of any plant taken, possessed, or sold in violation of any law, treaty,

or regulation of the United States, any Indian tribal law, or any law or regulation of any State.

The alpine zone of the San Francisco Peaks is included in the Kachina Peaks Wilderness Area (Arizona Wilderness Act of 1984 [Public Law 98-406]). This Act provides additional protection for the San Francisco Peaks groundsel through restrictions on motorized use, road building, and certain development activities. Some of the habitat is also in the San Francisco Peaks Research Natural Area, where stringent restrictions require even the installation of monitoring equipment be temporary (Goodwin, pers. comm. 1986).

Alpine Tundra Management Plan

The Alpine Tundra Management Plan listed eight proposed Snow Bowl Ski Area construction projects. Only one project, widening and paving of the Snow Bowl road, was considered to have any significant impact on Senecio. To counteract the impacts of increased summer visitor use, the following actions were proposed: 1) closure of the alpine to off-trail use; 2) construction of a hiking trail from the upper Snow Bowl Lodge to the saddle north of Agassiz Peak; 3) closure of the trail to Agassiz Peak; and 4) closure announcement by signs, public media announcements, and handouts, and monitoring for closure compliance.

Monitoring

A plan to monitor the impact of recreational activities on the plant was developed in 1984, and four monitoring plots have been established (Boucher 1984). Three plots are 1/100 acre circular plots in which Senecio franciscanus and associated species are recorded. A three by three foot square within the plot was photographed for visual reference, and location photos were taken. These plots are in the following situations: 1) heavy soil disturbance, no plants; 2) light disturbance, Senecio present; 3) past disturbance, Senecio present; and 4) no disturbance, Senecio present.

Propagation

A propagation and revegetation study of tundra plants was conducted by Coconino National Forest (Boucher 1982). Seeds of the San Francisco Peaks groundsel were collected in August and cold hardened in a freezer for two months. They were planted in mid-April in a 50:50 mixture of vermiculite and habitat soil or in pure vermiculite. Plants in pure vermiculite were more suitable for transplanting owing to their rapid root development. The soil was watered as needed. Within one week germination had occurred. A nitrogen and phosphate fertilizer (20-16-0) was added when chlorosis appeared. Plants were transplanted in June to a prepared bed or the tundra, and seed were produced by the plants in September. These plants are no longer being monitored.

Propagation studies of the San Francisco Peaks groundsel have been initiated by the Arboretum at Flagstaff (J. Milne, pers. comm. 1986). Seventy plants were germinated without pretreatment from seed in a peat moss/vermiculite mix. These plants have been increased through division, transplanted to cinder base mix, and are now growing in a lathhouse.

PART II

RECOVERY

Prime Objective

The prime objective is to manage the essential habitat of Senecio franciscanus so that healthy populations can be sustained in their natural habitat. Actions identified as necessary for meeting the prime objective and for delisting include:

1. Demonstrated long-term stability in population levels and habitat size and quality at current levels or greater through monitoring studies.

2. Actions identified in Alpine Tundra Management Plan are implemented.

3. Extend the improved trail system to the top of Humphrey's Peak; provide an alternate exit from the alpine zone.

4. Develop a cooperative agreement between the Forest Service and the Fish and Wildlife Service on monitoring and enforcement of closure.

These criteria are to be evaluated for adequacy prior to delisting.

Step-Down Outline

1. Remove threats to San Francisco Peaks grounsel by enforcement of existing regulations and by management for protection.

    11. Enforce existing laws and regulations.

    12. Continue implementation of Alpine Tundra Management Plan.

    13. Enforce closure of alpine zone.

    14. Extend improved trail system from saddle to summit of Humphreys Peak.

    15. Extend trail system to provide an exit from alpine zone.

    16. Develop a cooperative agreement between the Forest Service and the Fish and Wildlife Service on monitoring and enforcement of closure.

2. Study populations in their natural habitat.

    21. Study the ecological requirements of *Senecio franciscanus*.

22. Study the population biology of Senecio franciscanus.

221. Life history characteristics.

222. Establish monitoring program.

223. Study biotic factors.

3. Establish and maintain an ex situ population of Senecio franciscanus.

4. Develop public awareness, appreciation, and support for preservation of San Francisco Peaks Groundsel.

Narrative

1. Remove threats to San Francisco Peaks groundsel by enforcement of existing regulations and by management for protection. Populations of San Francisco Peaks groundsel occur on land managed by the U.S.D.A. Forest Service and should be protected by the enforcement of existing regulations and by application of existing management policies to remove threats to the species.

11. Enforce existing laws and regulations.
All existing regulations for the protection of threatened and endangered species on Federal lands need to be enforced. This includes the Endangered Species Act, the

Lacey Act, the Arizona Native Plant Law, as well as all existing Forest Service regulations on plant collection.

12. Continue implementation of Alpine Tundra Management Plan.

An Alpine Tundra Management Plan (MP) has been written for populations of San Francisco Peaks groundsel on Forest Service land. This document contains procedures for protection of plants in balance with such activities as hiking and skiing. Implementation of the plan is an essential step in delisting the San Francisco Peaks groundsel.

13. Enforce closure of alpine zone.

The current alpine closure to dispersed recreation should be monitored for effectiveness. The closure should be strongly enforced by on-ground patrol by rangers and/or volunteer rangers.

14. Extend improved trail system from saddle to summit of Humphreys Peak.

The improved trail system currently extends from the old Snow Bowl lodge to the saddle between Agaasiz and Humphreys Peaks. The unimproved trail from the saddle to the summit of Humphreys Peak needs to be brought up to the same standard, and the complete trail system should be maintained annually in the late spring.

15. Extend trail system to provide an exit from alpine zone.

Much of the potential threat to Senecio franciscanus has been alleviated through closure of the alpine zone of the San Francisco Peaks to dispersed use, and construction of the new trail routing people away from Agassiz Peak. The trail system needs to be extended to encourage hikers to keep moving through the alpine zone rather than lingering in the alpine zone where the trail now dead ends.

16. Develop cooperative agreement between Forest Service and Fish and Wildlife Service on monitoring and enforcement of closure.

To facilitate the management and protection of the San Francisco Peaks groundsel, a cooperative agreement between Forest Service and the Fish and Wildlife Service should be developed. Such an agreement should set forth long-term objectives and general management activities needed for monitoring and enforcement of closure.

2. Study populations in their natural habitat.

An in-depth knowledge of the plant's ecology and biology is needed to understand its habitat requirements. With this information, sound management decisions can be made and implemented to sustain healthy, natural populations.

21. Study the ecological requirements of Senecio franciscanus.

Studies on specific geological/edaphic parameters need to be done to determine factors that influence the exact distribution of the species. Required components and limiting factors should be determined.

22. Study the population biology.

The life history characteristics of Senecio franciscanus should be studied because they reflect the species' adaptations to its particular environment. Plants in general demonstrate higher fecundity and survivorship in some microhabitats than in others, so characteristics of subpopulations can indicate which abiotic and biotic components are most essential to survival of the species. Monitoring plots have been established at four sites on the Coconino National Forest. Continued study of these plots and establishment of new plots in different microhabitats are needed to assess trends.

221. Life history characteristics.

The frequency of seedling establishment, survivorship, fecundity, density-dependence of plants related to pollination, and reproductive index of the species are some factors that need to be considered. The biological consequences of Senecio being clonal also needs to be studied.

222. Establish monitoring program

A comprehensive and ongoing monitoring program is a critical element in determining the present status of San Francisco Peaks groundsel, with monitoring plots established in a representative cross-section of habitats with varying degrees of impact throughout the range of the plant. These monitoring plots, which are read every two to three years, are a necessary step for delisting the species. Monitoring will assist in determining long-term population and habitat stability, which is essential for delisting.

223. Study biotic factors.

Biotic factors influencing the survival of Senecio franciscanus need to be studied. The role of various potential herbivores in the ecology of the species needs to be determined. The interactions of pollinators and seed dispersers with the plants need to be assessed. Knowledge of such factors may facilitate the recovery of the species.

3. Establish and maintain an ex situ population of Senecio franciscanus.

A permanent, well-documented living collection with seed banking would provide material for research, public awareness projects, and education.

4. Develop public awareness, appreciation, and support for preservation of San Francisco Peaks groundsel.

Education of the public is a vital part of the recovery process. The cooperation of the public is essential for the ultimate success of the foregoing recovery measures. Volunteer rangers could educate the hiking public during the summer season concerning the sensitivity of the alpine zone to impact and the necessity of limiting access to maintained trails. High visibility support by public interest groups, especially local ones such as native plant societies, and the Nature Conservancy chapters, can be instrumental in shaping public opinion. The conservation needs of endangered and threated species could also be promoted through lectures to local organizations, pamphlets, and letters conncerning conservation of threatend and endangered species.

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PART III

IMPLEMENTATION SCHEDULE

The Implementation Schedule that follows outlines actions and costs for the San Francisco Peaks groundsel recovery program. It is a guide for meeting the objectives elaborated in Part II of this plan. This schedule indicates the recovery plan tasks, corresponding task numbers, task priorities, duration of tasks, ("ongoing" denotes a task that once begun should continue on an annual basis), responsible agencies and lastly, estimated costs for FWS tasks. These actions, when accomplished, should bring about the recovery of San Francisco Peaks groundsel and protect its habitat. It should be noted that monetary needs for agencies other than FWS are not identified and therefore Part III does not reflect the total financial requirements for the recovery of this plant.

General Categories for Implementation Schedule

Information Gathering - I or R (research)

1. Population status
2. Habitat status
3. Habitat requirements
4. Management techniques
5. Taxonomic studies
6. Demographic studies
7. Propagation
8. Migration
9. Predation
10. Competition
11. Disease
12. Environmental contaminant
13. Reintroduction
14. Other information

Management - M

1. Propagation
2. Reintroduction
3. Habitat maintenance and manipulation
4. Predator and competitor control
5. Depredation control
6. Disease control
7. Other management

Acquisition - A

1. Lease
2. Easement
3. Management agreement
4. Exchange
5. Withdrawal
6. Fee title
7. Other

Other - O

1. Information and education
2. Law enforcement
3. Regulations
4. Administration

Recovery Action Priorities

1 = an action that must be taken to prevent extinction or to prevent the species from declining irreversibly in the foreseeable future.

2 = an action that must be taken to prevent a significant decline in species population/habitat quality, or some other significant negative impact short of extinction.

3 = all other actions necessary to provide for full recovery of the species.

Abbreviations Used

FWS - USDI Fish and Wildlife Service
SE - Office of Endangered Species
LE - Law Enforcement
FS - USDA Forest Service
AF - Arboretum at Flagstaff

PART III - IMPLEMENTATION SCHEDULE

GENERAL CATEGORY	PLAN TASK	TASK #	PRIORITY #	TASK DURATION	RESPONSIBLE AGENCY FWS REGION	FWS PROGRAM	OTHER	FISCAL YEAR COSTS* FY1	FY2	FY3	COMMENTS
02	Enforce existing regulations	11	2	ongoing	2	LE	FS	existing funds			
M3	Continue implementing management plan	12	2	ongoing			FS				
02	Enforce closure of alpine zone	13	2	ongoing			FS				
M3	Extend trail system	14,15	2	1 year			FS				
M7	Develop cooperative agreement between USFWS and FS	16	2	1 year	2	SE	FS	2,000			
R3	Study ecological requirements	21	2	3 years	2	SE		20,000	10,000	10,000	

PART III IMPLEMENTATION SCHEDULE

GENERAL CATEGORY	PLAN TASK	TASK #	PRIORITY #	TASK DURATION	RESPONSIBLE AGENCY FWS REGION	RESPONSIBLE AGENCY FWS PROGRAM	RESPONSIBLE AGENCY OTHER	FISCAL YEAR COSTS* FY1	FY2	FY3	COMMENTS
43	Study the population biology	22	2	3 years	2	SE		20,000	10,000	10,000	
41	Establish and maintain ex situ population	3	2	3 years	2	SE		20,000	10,000	10,000	
01	Develop public awareness and support	4	3		2	SE	FS	5,000	1,000	1,000	

*Costs refer to USFWS expenditures only.

APPENDIX

List of Reviewers

A technical/agency review draft of the San Francisco Peaks groundsel was sent to the following individuals and agencies on November 26, 1987.

Ms. Donna House
Navajo Natural Heritage Program
P.O. Box 2429
Window Rock, Arizona 86515

Mr. Andy Laurenzi
The Nature Conservancy
Tucson, Arizona 85717

Dr. Gary Nabhan
Desert Botanical Gardens
1201 Galvin Parkway
Phoenix, Arizona 85008

Mr. Reggie Fletcher
U.S. Forest Service
517 Gold Avenue, SW
Albuquerque, New Mexico 87102

Dr. Peter Bennett
National Park Service
CPSU/UA
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Tucson, Arizona 85717

Ms. Jeanette Milne
The Arboretum at Flagstaff
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Flagstaff, Arizona 86001

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Mu8seum of Northern Arizona
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Flagstaff, Arizona 86001

Dr. Art Phillips
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Phoenix, Arizona 85023

Ms. Mary Butterwick
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San Francisco, California 94110

Dr. Donald Pinkava
Arizona State University
Department of Botany
and Microbiology
Tempe, Arizona 85287

Dr. William G. McGinnes
President, Arizona Native
Plant Society
530 East Cambridge Drive
Tucson, Arizona 85704

Dr. Frank Thibodeau
The Center for Plant Conservation
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Jamaica Plain, Maryland 02130

Mr. Sotero Muniz
Regional Forester
U.S. Forest Service
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Albuquerque, New Mexico 87102

Dr. Ivan J. Shields
Chairman, Arizona Commission on
Agriculture and Horticulture
1688 West Adams, Room 421
Phoenix, Arizona 85007

Fish and Wildlife Service
Field Supervisor
Ecological Services Field Office
Phoenix, Arizona

Assistant Regional Director
Law Enforcement, Region 2
Fish and Wildlife Service
Albuquerque, New Mexico

Comments Received

Comment letters are reproduced in this section followed by the Service's response to each comment. Some reviewers submitted part or all of their comments marked directly on the draft plan. These comments, which were mostly editorial in nature, have not been reproduced.

United States Department of Agriculture
Forest Service
35
Southwestern Region
517 Gold Avenue SW.
Albuquerque, NM 87102

Reply To: 2670

Date: JAN 13 1987

Rec'd FWS-Region 2 JAN 20 '87 RD

RD
DRD
ABA
AFF
ARW
AWE
ALE
APA
AHR
Cole
File
Action SE
CL 1/194

Mr. Michael Spear
Regional Director
Fish and Wildlife Service
P.O. Box 1306
Albuquerque, NM 87103

Dear Mr. Spear:

We appreciate the opportunity to comment on your Draft Recovery Plan for the Threatened plant Senecio franciscanus. The following comments were prepared by Reggie Fletcher, our Regional Botanist.

A-1 On page 12 under Legal Protection, it should be noted that S. franciscanus receives additional protection by the Forest Service. In addition to permits from the Fish and Wildlife Service and the State of Arizona, persons wishing to collect this species must obtain permission from the Forest Service. Likewise, persons wishing to study this species must coordinate their activities with Forest Service personnel due to closure of the alpine on the San Francisco Peaks.

A-2 The four objectives outlined in part 2, page 16, that are to be attained prior to delisting appear to be sufficient and should provide an adequate safeguard for S. franciscanus.

A-3 Sections 1.1 through 1.3 of the Narrative need a slight modification to denote a continuation of enforcement rather than an initiation of enforcement. The first sentence of 1.3 should be changed to "The current alpine closure to dispersed recreation should be monitored for effectiveness. Enforcement must be commensurate with the level required to ensure compliance of alpine travel by trail only or at least the 95 percent level. The compliance level would need to be raised if 95 percent compliance were shown to be inadequate to ensure protection for the senecio.

A-4 Plots such as are mentioned in Section 222 of the Narrative have already been established. Additional plots will be needed only if the existing ones prove to be inadequate. However, a periodic general monitoring of the overall health of the alpine would be beneficial.

End. Sp. R-2
JOHNSON
Burton
Lovato
Lucras
SANCHEZ
FILE

FWS REG 2
RECEIVED
JAN 20 '87
SE

Mr. Michael Spear 2

Additional comments on the Recovery Plan provided by the Coconino National Forest are provided as an enclosure. We look forward to continued cooperative efforts towards the recovery of S. franciscanus.

Sincerely,

for DAVID F. JOLLY
Deputy Regional Forester

Enclosure

cc:
Coconino NF

United States Department of Agriculture
Forest Service
Coconino NF
2323 E. Greenlaw Lane
Flagstaff, AZ 86004

Range Management

WILDLIFE MANAGEMENT R-3
JAN - 5 1987

JAN 06 1987

Reply to: 2670

Date: JAN 02 1987

RANGE MANAGEMEN	
Initials	
Action x Info ✓	
Snyder	
Harrison	
Galen	
Partida	
Fletcher	✓
Moir	
Nunez	
Jaramillo	
Gebert	

Initials	
Action x Info ✓	
Director	
Planning	
WNC	
T&E	
AZ Zone Biol.	
NM& Zone Biol.	
Secretary	X

Subject: Comments on Draft Recovery Plans (Your ltr. 12/2)

To: Regional Forester

We have reviewed the draft Recovery Plans for Senecio franciscanus and Cowania subintegra and offer the following comments:

On the Cowania Recovery Plan;

1. Figure 1 does not show the Verde Valley population.

2. Page 32, No. 6, suggests a mandate against road development. If this is the case, Arizona State Parks should be contacted regarding proposed developments at Dead Horse State Park. The State is presently considering alternatives for additional access to the Park.

3. Page 31, we question the need to monitor every 2 years. Monitoring every 5 years will be sufficient to determine "long-term population and habitat stability."

4. This recovery plan fails to take into account the recent work done by Clark Schaack of Northern Arizona University. His work needs to be considered before any recovery plan can be finalized.

On the Senecio Recovery Plan:

B-1 1. Page 2, should be July 10, 1884.

B-2 2. Page 8, second paragraph, should be Goodwin 1978.

3. Page 13, second paragraph, trails can be constructed in a Research Natural Area (RNA) if necessary for management of the area. In
B-3 fact, a trail already exists from Humphreys Peak down the mountain through the RNA. The Forest plans to maintain the trail to encourage people to stay on the trail to minimize impacts to the RNA and tundra on Humphreys Peak.

4. Page 19, No. 13, does this mean that the entire alpine area is to be closed? If this is what this plan calls for, it would seem
B-4 unnecessary to close this much of the area.

B-5

5. Page 22, first paragraph, we question the need for additional monitoring plots. This area is small, 1,200 acres, and we feel the plots that are already established represent a good cross section of habitats.

NEIL R. PAULSON
Forest Supervisor

Enclosures

GGoodwin:bjo 12/31/86

Response to Comments

A-1 Comment incorporated.

A-2 Comment noted.

A-3 Comment incorporated.

A-4 The monitoring plots established by Forest Service personnel are for monitoring habitat degradation by recreational uses and plant reestablishment. The plots proposed in the recovery plan are to study population biology and ecological requirements of Senecio franciscanus.

B-1 The date has been corrected.

B-2 The citation has been corrected.

B-3 Comment incorporated.

B-4 The area discussed is identical to the area closed above 11,400 foot elevation by the Forest Service on May 21, 1984.

B-5 See comments at A-4.